AMSAT News Service Weekly Bulletins
Issue: ANS-092
Date: 2012-04-01
Sources: amsat-ans-2012-ans-092-weekly.txt

AMSAT NEWS SERVICE
ANS-092

ANS is a free, weekly, news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

Please send any amateur satellite news or reports to:
ans-editor@amsat.org

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ANS-092 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 092.01
>From AMSAT HQ SILVER SPRING, MD.
April 1, 2012
To All RADIO AMATEURS
BID: $ANS-092.01

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* Volunteers are needed to help at the AMSAT booth at Dayton. Gould *
* WA4SXM, is looking for volunteers to help man the AMSAT booth dur- *
* ing the 2012 Hamvention. People are needed all 3 days for 2 hour *
* shifts. Please send the days and times you are available to help *
* as well as how many shifts you are willing to work via e-mail to *
* wa4sxm at amsat.org. *
* Monitor http://www.amsat.org/amsat-new/hamvention/2012/Dayton.php *
* for the latest AMSAT at Dayton news and developments *
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AMSAT Theme at Dayton 2012: Running with Fox

The 2012 Dayton Hamvention will be held this year on 18 - 20 May 2012. As has been the case for the many years Hamvention will be at the Hara Arena Complex on the north side of Dayton. AMSAT will occupy the same booths (444-449) in Ball Arena, right across from the ARRL area and just inside the door from the Satellite Demonstration area.

The AMSAT theme for 2012 is "Running with Fox". We will have multiple exhibits of the new AMSAT satellite on display.

Visit AMSAT's Dayton Hamvention page for all details on activities:
http://www.amsat.org/amsat-new/hamvention/2012/Dayton.php

Some of the activities will include:

+ Life size Fox models will be on display as well as diagrams of
   the modules inside the 10cm square satellite.

+ Operational prototype of ARISSat-1 on display.

+ AMSAT Thursday Night Get-together at the Tickets Pub & Eatery.

+ The sixth annual AMSAT/TAPR Banquet will be Friday night May 18
   at the Kohler Banquet Center. The price for the Banquet is $30.
   Seating is limited and reservations are required. Follow the
   links on AMSAT's Dayton page.

+ The AMSAT Forum will be on Saturday May 19.

AMSAT/TAPR Friday Night Banquet

AMSAT/TAPR Banquet on Friday night, May 18 is one of the main AMSAT activities during the 2012 Hamvention at Dayton.

AMSAT is pleased to announce that Howard Long, G6LVB will be the featured speaker for the evening event. Howard will be talking about his FUNcube Dongle, the 64 - 1700 MHz Software Defined Receiver. This innovative USB device is the size of a thumbdrive and has an SMA antenna socket. Multiple SDR control and display software programs can be used with the FUNcube Dongle.

Banquet tickets will not be sold at the AMSAT booth during the Hamvention so reservations must be made through the AMSAT Store:
http://www.amsat-na.com/store/item.php?id0158
Tickets are $30 apiece.

ARISS Mentor Introduction at Dayton 2012

AMSAT and ARRL are teaming up during the 2012 Hamvention to recruit new ARISS (Amateur Radio on the International Space Station) Technical Mentors and Ground Station Operators.

Friday and Saturday (May 18 & 19) at 4pm in the ARRL stage area AMSAT Vice President for Educational Relations Mark Hammond N8MH will explain the need for additional ARISS Technical Mentors and Ground Station Operators and the requirements and responsibilities needed to help provide a reliable conversation between astronauts and selected schools or groups.

Technical Mentors serve as an advising and coordinating liaison between NASA, the school or group making the ARISS contact, and the Ground Station Operators, who set up the satellite station at the contact location. We encourage anyone interested in helping make future school contacts with the ISS successful to please attend.

AMSAT to Facilitate Student Satellite Contacts

AMSAT is encouraging all students attending the 2012 Dayton Hamvention to come by the Satellite Demonstration Area just outside of the Ball Area entrance and make a contact using the amateur satellites. There will be AMSAT volunteers there to explain how to make the contacts and during actual satellite passes will try to get as many students as possible to complete actual contacts. There are lists of satellite pass times in the satellite demonstration area and at the AMSAT booth.

[ANS thanks Gould Smith, WA4SXM for the above information]

AMSAT-NA Board of Directors Nominations

It is time to submit nominations for the upcoming open seats on the AMSAT-NA Board of Directors. A valid nomination requires either one current Member Society, or five current individual members in good standing, to nominate an AMSAT-NA member for the position.

Three directors and two alternate directors have terms expiring this year. The director seats open for election are held by Tom Clark, K3IO; Lou McFadin, W5DID; and Gould Smith, WA4SXM. The alternate director seats open for election are held by Mark Hammond, N8MH and Patrick Stoddard, WD9EWK.

The three nominees receiving the highest number of votes will be seated as regular board members with two year terms. The two nominees receiving the next highest number of votes will be seated as alternate directors for one year.

Written nominations, consisting of names, calls and individual signatures, should be mailed to: AMSAT-NA, 850 Sligo Ave #600, Silver Spring, MD, 20910. They must be received no later than June 15th. No other action is required.

Nominations may also be made by electronic means including e-mail, FAX, or electronic image of a petition. Electronic petitions should be sent to MARTHA@AMSAT.ORG or faxed to 301-608-3410, and also must be received by June 15th. If using any electronic submission, there is a second, verifying step:

> ELECTRONIC SUBMISSIONS WITHOUT THIS SECOND, WRITTEN VERIFICATION ARE NOT VALID UNDER THE EXISTING AMSAT-NA BYLAWS. A verifying traditional written petition MUST be received at the AMSAT-NA office at the above address within 7 days following the close of nominations.

[ANS Thanks AMSAT Secretary Alan Biddle, WA4SCA for the above information]

QB50 CubeSat Proposal Deadline Extended to April 30

QB50 is a network 50 CubeSats in a 'string-of-pearls' configuration that will be launched together in the first half of 2015 by a single rocket, a Shtil-2.1, from Murmansk, Northern Russia into a circular 320 km altitude, 79 degree inclination orbit. (https://www.qb50.eu) The mission lifetime of individual CubeSats is estimated to be about three months.

The von Karman Institute for Fluid Dynamics in Brussels, Belgium is accepting CubeSat proposals from interested University and Research teams until April 30. The selection of 50 CubeSats for the exploration of the lower thermosphere, re-entry research and in-orbit demonstration of new technologies and miniaturized science sensors will be made by the Selection Committee in early June. Proposing teams will be individually notified of their selection/non-selection shortly thereafter.

The 50 CubeSats will comprise an on-orbit network of:

+ About 40 atmospheric 2U CubeSats
+ About 10 2U or 3U CubeSats for In-Orbit Demonstration of science and technology payloads.

All 40 atmospheric 2U CubeSats and most of the 10 2U and 3U CubeSats for In-Orbit Demonstration will carry a set of standardized sensors for multi-point, in-situ, long-duration measurements of key parameters and constituents in the largely unexplored lower thermosphere and ionosphere. Once requirements for the standardized sensor package and network/communication requirements have been met the CubeSat team may use remaining on-board space or electronic capability to conduct their own additional research.

QB50 will also study the re-entry process by measuring a number of key parameters during re-entry, e.g. CubeSat on-board temperature and deceleration.

A single CubeSat is simply too small to also carry sensors for significant scientific research. Hence, for the universities the main objective of developing, launching and operating a CubeSat is educational. However, when combining a large number of CubeSats with identical sensors launched at the same time into a network, in addition to the educational value, fundamental scientific questions can be addressed which are inaccessible otherwise.

Networks of CubeSats have been under discussion in the CubeSat community for several years, but so far no university, institution or space agency has taken the initiative to set up and coordinate such a powerful network. The QB50 network can still fully achieve its mission objectives even if a few CubeSats fail.

Typically, a university builds a CubeSat and launches it into low Earth orbit. It also builds or already has available a ground station to track the CubeSat and enable uplink/downlink telecommunications.

The period in a low-Earth orbit (about 600 km altitude) is about 90 minutes, but the duration of a satellite pass over the ground station is approximately 10 minutes in the best case to no coverage at all for most of the 16 daily orbits. When supporting only one satellite project the ground station is not in operation 97% of the time. If a mission critical emergency occurs aboard the CubeSat it can be only addressed on single orbits within range of the dedicated ground station.

An international network, the Global Educational Network for Satellite Operations (GENSO), under development may well be set up in time for QB50. It would eventually comprise more than 100 ground stations in different parts of the world, providing a vastly improved uplink and downlink capability for all CubeSats. The international QB50 network in orbit would be the first major user of the international GENSO network on the ground. In case GENSO is not set up in time for QB50, CubeSat teams are encouraged to set up a subset ground station network comprising any number of ground stations.

The QB50 homepage can be accessed at: https://www.qb50.eu

[ANS thanks the QB50 Project for the above information]

SpaceDaily Posts Article Detailing RAX-2 CubeSat Scientific Success

An article posted on SpaceDaily.com gives additional details of the successful RAX-2 CubeSat scientific success. In their Solar Science section, "Researchers take first-ever measurement of auroral turbulence using a nanosatellite radar receiver", is an article further explaining the scientific discovery. Read the full article on-line at: http://tinyurl.com/UniverseToday-RAX2

[Menlo Park CA (SPX) Mar 26, 2012] - Researchers from SRI International and the University of Michigan have taken the first-ever measurement of naturally occurring auroral turbulence recorded using a nanosatellite radar receiver. The research was done with support from the National Science Foundation (NSF) and NASA's Educational Launch of Nanosatellites (ELaNa) Initiative.

The distinctive radar echoes recorded on March 8 were taken with the Radio Aurora Explorer (RAX) CubeSat. The RAX nanosatellite measured turbulence over Fairbanks, Alaska that was a direct result of a geomagnetic storm triggered by the largest solar flare in the past five years.

The Earth's high latitude ionosphere, a region of the upper atmosphere associated with solar-driven aurora or "northern lights," becomes highly unstable when large currents flow during geomagnetic storms. RAX was specifically designed by SRI and the University of Michigan to measure this auroral turbulence from an orbital vantage point inaccessible to traditional ground-based radars.

"The RAX radar echo discovery has convincingly proved that miniature satellites, beyond their role as teaching tools, can provide high caliber measurements for fundamental space weather research," said Therese Moretto Jorgensen, Ph.D., Geospace program director in the Division of Atmospheric and Geospace Sciences at the National Science Foundation.

The project's mission was to use small satellites called CubeSats to remotely explore formation of charged particle filaments created in response to intense electrical currents in space.

These plasma structures, a form of turbulence called field-aligned irregularities (FAIs), can distort communication and navigation signals such as global positioning systems (GPS). During the recent solar flare, RAX measured FAI echoes using the Poker Flat Incoherent Scatter Radar (PFISR), an NSF research radar operated by SRI.

"The recently collected radar echoes allow us to determine the root cause and to possibly predict future disturbances in the auroral ionosphere - disturbances that can severely compromise communication and GPS satellites," said Hasan Bahcivan, Ph.D., a research physicist in SRI's Center for Geospace Studies, and principal investigator of the RAX mission.

A team of University of Michigan students under the direction of James Cutler, Ph.D., an assistant professor in the Aerospace Engineering Department, designed, built, and operated the satellite and gathered the radar echo data.

RAX was the first CubeSat to be selected as part of an NSF program to use small satellites for space weather and atmospheric research. The RAX CubeSat is a three liter satellite weighing three kilograms. It was launched by NASA on October 28, 2011, and has since completed 18 experiments.

[ANS thanks SpaceDaily.com for the above information]

NASA Credits Increasing CubeSat Capability in O/OREOS Mission Success

Launched in November, 2011 NASA's Organism/Organic Exposure to Orbital Stresses (O/OREOS) nanosatellite has successfully carried microorganisms to a high-inclination, low-Earth orbit and monitored the effects of the space environment on their growth and metabolism.

Two populations of the microbe Bacillus subtilis into space. One set of microbes was a naturally occurring strain, and the second was a radiation-resistant mutant strain. The microorganisms were part of the Space Environment Survivability of Live Organisms (SESLO) project, which characterized the growth, activity, health and ability of microorganisms to adapt to the stresses of the space environment including exposure to a total dose rate of radiation nearly 15 times greater than that experienced in the orbit of the International Space Station.

In space, bacterial spores successfully germinated and grew after 14 days in orbit and again after 97 days. In microgravity, the cells generally grew and metabolized more slowly than their counterparts on Earth. Interestingly, the microorganisms grown at 97 days of exposure showed no significant difference in their growth parameters than those grown at 14 days. The study provides insight into how living organisms cope with life beyond our planet.

O/OREOS also carried another set of experiments: the Space Environment Viability of Organics (SEVO), which monitored the stability and changes in four classes of organic molecules during spaceflight.

"The full success of the O/OREOS mission demonstrates convincingly that cubesats can be cost-effective platforms for performing science research and conducting technology demonstrations," said Mary Voytek, senior scientist of NASA's Astrobiology Program at NASA Headquarters, in a statement from NASA.

"The capabilities of cubesats are growing steadily, making them good candidates to operate precursor experiments for missions on larger satellites, the International Space Station, lunar surface exposure facilities, and planetary exploration."

The full story can be accessed on SpaceDaily.com at:
http://tinyurl.com/NASA-OREOS

ARISS Contacts Receive Media Coverage

Media coverage of recent ARISS contacts can viewed on-line. The ARISS contact on March 21 with students at Salem Elementary in Apex, North Carolina had the opportunity to question of astronaut Don Pettit KD5MDT 241 miles (388 km) up and on the other side of the Earth aboard the International Space Station. Tony Hutchison, VK5ZAI provided the telebridge link to the ISS amateur radio station NA1SS.

Local television coverage on WRAL-TV and a report of the contact

can viewed on-line at:
http://www.wral.com/weather/blogpost/10904028/

News 14 Channel coverage of the Apex ARISS contact is at:
http://tinyurl.com/news14-ARISS

The News Observer article can be read at:
http://tinyurl.com/newsobserver-ARISS

Listen to an interview with some of the students:
http://www.wcpss.net/podcast/2012_march22_salem/index.mp3

Also on March 21 the Swiss Air Force Museum Clin d'Ailes, located on the Swiss Airforce Base in Payerne, Switzerland, established an ARISS contact with ESA astronaut Andr Kuipers, PI9ISS, aboard the International Space Station.

Astronaut Andr Kuipers operated with the ISS callsign OR4ISS. This was a direct contact performed by the Amateur radio Club station HB9SPACE, located in the museum. Two videos of this event can be viewed on-line at:
http://www.20min.ch/ro/videotv/?vid$4405&cid0
http://www.20min.ch/ro/videotv/?vid$4395&cid0

Southgate ARC provides detailed coverage of the HB9SPACE event at:
http://tinyurl.com/HB9SPACE-ARISS - and -
http://www.uk.amsat.org/6095

[ANS thanks ARISS, AMSAT-UK and Southgate ARC for the above information]

Satellite Shorts From All Over

+ The ESA's Education Office has maintained frequent contacts with the student teams to follow the progress of their satellite operations after the February 13 launch of the Vega rocket delivering seven ESA-sponsored CubeSats into low Earth orbit. The status of the CubeSats is posted at:
  http://www.esa.int/SPECIALS/Education/SEM2KRGY50H_0.html
  Photos posted at:
  http://www.esa.int/SPECIALS/Education/SEM2KRGY50H_1.html

+ Call for Papers - Central States VHF Society 46th Annual Conference, Cedar Rapids, Iowa, July 26-28, 2012. If you would like to contribute a paper, presentation, or poster, please contact Rod Blocksome, K0DAS, CSVHF Conference Program Chairman as soon as possible with the title and a short description. You can reach Rod at k0das@arrl.net or at his callbook address. Their web page for authors can be found at:
  http://www.csvhfs.org/2012conference/index.html#

+ The ARISS International monthly teleconference was held on Tuesday, March 20. The HamTV discussion covered the meetings that ESA and NASA are engaging in to ensure coordination of the project. Minutes have been posted: http://ariss.rac.ca/arisstel2012-03-20.htm

+ TAMSAT Project Coordinator, Levent Sasmazel, WW2L posted good news about TAMSAT, Association of Amateur Satellite Technologies in Turkey completion of the Internal Housekeeping Unit processor of their satellite. Photos and a full description are posted on the

AMSAT-UK web at: http://www.uk.amsat.org/6085

+ The WebSDR receiver is located at the Astronomical Observatory Department of "Stefan cel Mare" University in Suceava, Romania has added coverage of 437.470 - 437.515 MHz to enable reception of the Romanian amateur radio CubeSat Goliat. The original WebSDR receiver at this site provides coverage of the 3.5 MHz band. Tune in at: http://sdr.opt.ro:8901/ More information about the Goliat CubeSat is posted at: http://www.goliat.ro/

+ Light your fire. AMSAT-UK posted news about the STRaND-1 smart phone amateur radio CubeSat Plasma Propulsion Thruster. This system will be the first propulsive technology to provide very precise attitude control and pointing. Read the full article at: http://www.uk.amsat.org/6039

+ The BBC TV Newsnight show covered Clyde Space and UKube-1 in a recent airing. UKube-1 is a 3U CubeSat being designed and produced by Clyde Space for the UK Space Agency. UKube-1 is the UK's first CubeSat and will fly a total of 6 independent payloads. UKube-1 will carry a set of AMSAT-UK FUNcube boards providing a 435/145 MHz linear transponder and BPSK telemetry beacon. Watch the BBC episode at: http://www.uk.amsat.org/5983

+ Know when to duck ... NASA Jet Propulsion Labs has an on-line tool (with web, telnet, and e-mail interfaces) called the HORIZONS system which can be used to generate ephemerides for solar-system bodies. The Near-Earth Object Human Space Flight Accessible Targets Study (NHATS) and the HORIZONS system will allow prediction of the passage of Near Earth Asteroids. (These are scientific tools but offer a significant learning opportunity for citizen scientists.) Check out http://neo.jpl.nasa.gov/nhats/ - and - http://neo.jpl.nasa.gov/cgi-bin/nhats
HORIZONS access is at: http://ssd.jpl.nasa.gov/?horizons

+ Echolink SATCHAT net control Vince Waelti, K9TSU announced the new schedule of the on-line net. SATCHAT will meet on the AMSAT Server on Echolink 1900-2030 hours CDT (UTC-5) on the first, third, and fifth Saturdays of each month. A few upcoming dates for the net: April 7, April 21, May 5, May 19, June 2, June 16. All interested amateur radio operators are invited to check in.

+ Watch the launch of ESA's ATV Edoardo Amaldi on an Ariane 5 rocket from Europe's Spaceport in Kourou, French Guiana, on March 23: http://www.spaceref.com/news/viewpr.html?pid6517

+ Check out this linked image. All those tiny points of light aren't stars; they're entire galaxies, seen by the European Southern Observatory's VISTA survey telescope located at the Paranal Observatory in Chile. ESO's UltraVISTA survey revealed over 200,000 distant galaxies: http://tinyurl.com/VISTA-galaxies (UniverseToday.com)

+ Using state-of-the-art deep sea sonar, a team says they have found the Apollo 11 engines lying 14,000 feet below the surface. Plans to attempt to raise one or more of them from the ocean floor are under study. It is unkown yet what condition these engines might be in because they hit the ocean at high velocity and have been in salt water for more than 40 years. A short article is posted at: http://nasawatch.com/archives/2012/03/jeff-bezos-to-a.html

+ Yuri's (VE3/UT1FG/MM) ship was the first foreign ship to dock in Toronto for the 2012 shipping season. The event is celebrated in a ceremony and the captain is crowned with a 150 year old Beaver Hat on the ship. Yuri should be in Thunder Bay on April 1st. He

expects to be there for several days. The next destination is
Puerto Rico. Watch on YouTube: http://tinyurl.com/UT1FG-TorontoHat
(via John, K8YSE)

[ANS thanks everyone for the above information]

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In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits. Application forms are available from the AMSAT Office.

Primary and secondary school students are eligible for membership at one-half the standard yearly rate. Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status. Contact Martha at the AMSAT Office for additional student membership information. And with that please keep in mind the ham who produced a theatrical performance about puns. Reviews said it was a play on words.

73,
This week's ANS Editor,
JoAnne Maenpaa, K9JKM